ENVIRONMENTAL ASSESSMENT

Fertility Control Application for Wild Mares in the McCullough Peaks Herd Management Area

BLM

Cody Field Office, Wind River/Bighorn Basin District, Wyoming

January 2010

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

BLM/WY/PL-11/007+1060

DOI-BLM-WY020-EA11-9

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

ENVIRONMENTAL ASSESSMENT (EA)
WY-020-EA11-9
Fertility Control Application for Wild Horse Mares in the McCullough Peaks Herd Management Area

Based on the analysis of potential environmental impacts in EA DOI-BLM-WY020-EA11-9, I have determined that the Proposed Action will not have a significant effect on the human environment. Therefore, the preparation of an environmental impact statement is not required for compliance with the National Environmental Policy Act of 1969.

Reasons for this finding are based on my consideration of the Council on Environmental Quality (CEQ) criteria for significance (40 CFR 1508.27) with regard to the context and intensity of impacts.

Context: The affected region is limited to the McCullough Peaks HMA. The environmental analysis was prepared with input from the interested parties.

Intensity: There is no evidence that the severity of impacts is significant**:**

1. The action is expected to meet BLM's objective for wild horse management of maintaining a thriving natural ecological balance and multiple use relationship consistent with other resource needs.

2. The proposed action has no effect on public health or safety.

3. The proposed action has no potential to affect unique characteristics such as historic or cultural resources. No adverse impacts to the McCullough Peaks HMA are anticipated. There are no wild and scenic rivers, or ecologically critical areas present in the area.

4. The effects of the proposed action on the quality of the human environment are not considered to be highly controversial, and effects of fertility control are well known and understood.

5. Possible effects on the human environment are not highly uncertain, and do not involve unique or unknown risks.

6. The action is compatible with future consideration of actions required to improve wild horse management in conjunction with meeting objectives for wildlife habitat and achieving and maintaining a thriving natural ecological balance within the herd management area.

7. The proposed action is not related to other actions with individually insignificant, but cumulatively significant impacts.

8. The proposed action has no potential to adversely affect properties listed or eligible for listing in the National Register of Historic Places, and would not cause loss or destruction of significant scientific, cultural, or historical resources.

9. The proposed action would have no effect on any other threatened or endangered species or habitat determined to be critical under the Endangered Species Act.

10. The proposed action does not threaten to violate any Federal, State, or local laws or requirements imposed for the protection of the environment.

_____ _____

Michael P. Stewart DATE
Field Manager, Cody

Fertility Control Application for Wild Horse Mares
in the
McCullough Peaks Herd Management Area
Preliminary Environmental Assessment (WY-020-EA11-9)

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1.0 BACKGROUND INFORMATION

1.1 Introduction

This environmental assessment (EA) is tiered to the 2008 McCullough Peaks Herd Management Area Gather & Fertility Control Implementation Plan (WY-020-EA08-86) and the Finding of No Significant Impact and Decision Record dated October 18, 2009 in accordance with the Council on Environmental Quality (CEQ) regulations, 40 CFR 1502.2, and incorporates by reference all the descriptions of the affected environment and impacts analyzed in the 2008/2009 Gather and Fertility Control Implementation Plan and EA and subsequent Finding of No Significant Impact (FONSI) and Decision Record (DR). The decisions associated with both of these previous EA's were successfully implemented without any legal action. This EA has been prepared to analyze the impacts associated from application of fertility control to wild horse mares within the McCullough Peaks through 2015 (or as long as we can reasonably conclude that no new information and no new circumstances have substantially changed in the area of analysis). The 2008/2009 Gather & Fertility Control Implementation Plan and EA with FONSI and DR are available on the Bureau of Land Management (BLM), Cody Field Office (CYFO) website at:

http://www.blm.gov/wy/st/en/info/NEPA/documents/cyfo/mcculloughpeakshma.html

The BLM has determined that 70 to 140 wild horses (excluding current year's foals) are needed in order to ensure and achieve a thriving natural ecological balance. The proposed fertility control would begin in 2011 and continue through 2015 (or as long as we can reasonably conclude that no new information and no new circumstances have substantially changed in the area of analysis). The proposed action should help prevent deterioration of the rangelands and help maintain a thriving natural ecological balance and multiple use relationships as described in the 2008/2009 EA. By achieving and maintaining AML in the McCullough Peaks HMA, BLM meets it objectives in this HMA, RMP, and the WY Consent Decree. The proposed population control is in conformance with the Cody Resources Management Plan Final EIS (1990) Record of Decision (ROD) objectives to manage for the balance between a health population of wild horses and improvements in range condition, wildlife habitat, and watershed condition. The proposed action is in conformance with the Wild Free-Roaming Horses and Burros Act of 1971 (PL 92-195 as amended) and with all applicable regulations at 43 CFR (Code of Federal Regulations) 4700, and policies outlined by BLM.

The method of fertility control would be through remote darting application utilizing liquid porcine zona pellucida (PZP) into selected mares over one year of age. Two separate EA's have analyzed the impacts of PZP fertility control to wild horses within the McCullough Peaks HMA. PZP was utilized in 2004 and 2009, in various prescriptions, applications, and forms.

1.2 Location

The Cody Field Office area is located in northwestern Wyoming and contains the McCullough Peaks Wild Horse Herd Management Area, which is located 15 to 27 miles east of Cody (see Map 1). The herd management area encompasses 109,814 acres of land (see Map 2). Topography is highly variable, ranging from mostly flat to slightly rolling foothills carved by drainages, colorful badlands, and desert mountains featuring steep slopes, cliffs, and canyons. The HMA is bordered on the south by

State Highway 14-16-20, on the east by State Highway 32, on the north by Bureau of Reclamation lands, and on the west partially by allotment boundary fences and natural terrain features (division between the Deer Creek and Whistle Creek drainages).

1.3 Purpose and Need for the Proposal

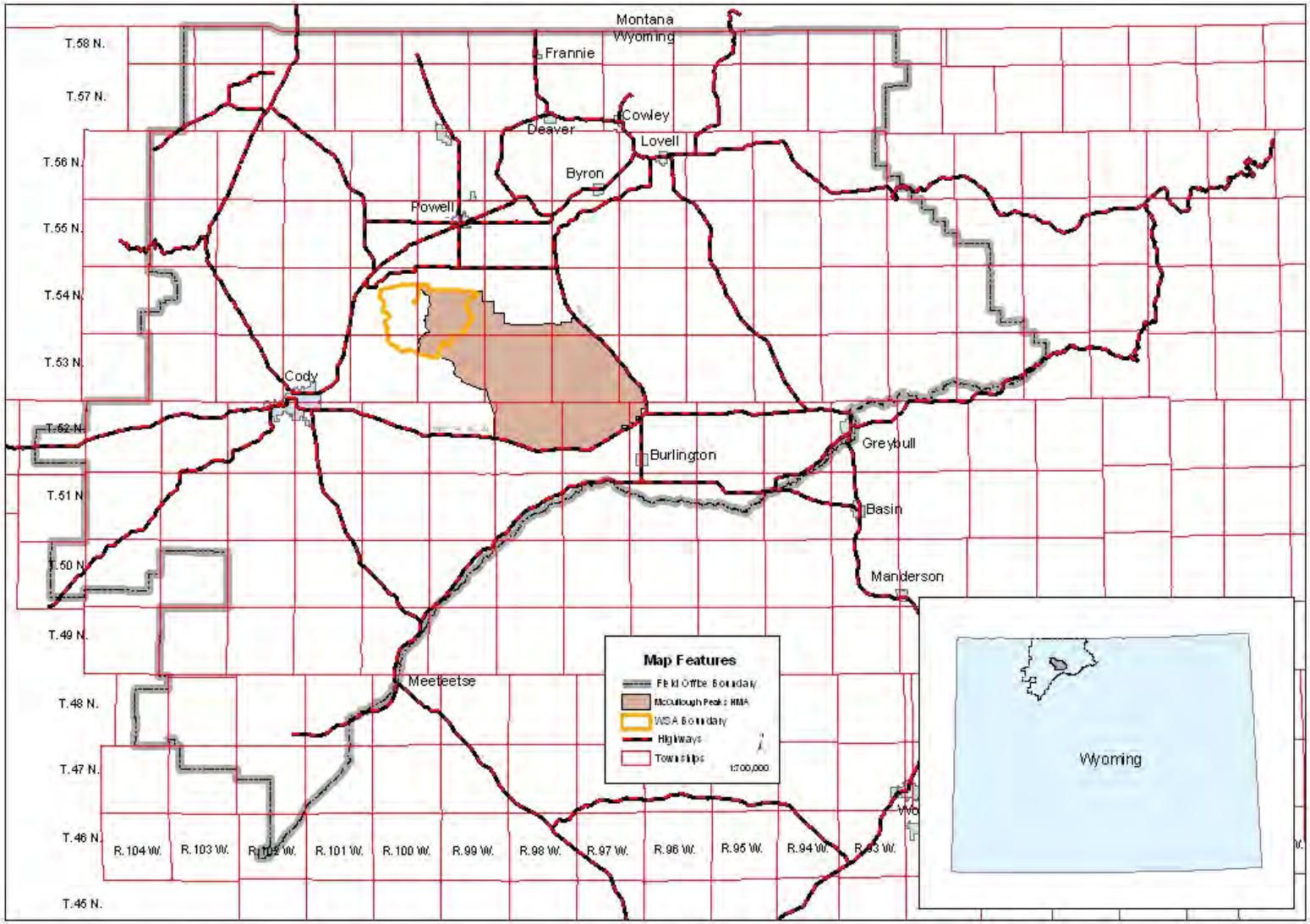
Traditionally, the management of the McCullough Peaks HMA populations has relied upon gathers and removals. Since 1973, annual inventory aerial counts have been made (until recently due to budget cuts or no funding). Gathers have occurred in 1983 (215 removed), 1987 (152 removed), 1992 (225 removed), 1995 (170 removed), 1999 (188 removed), 2004 (362 removed), and 2009 (94 removed). In 2004, the total gather costs were approximately $135,800 to gather 462 wild horses and remove 362 horses and ship them to Canyon City, Colorado. In 2009, total gather costs were approximately $102,076 to gather 192 horses and remove 94 horses and ship them to the Rock Springs holding facility. Gathers and removals alone will not address the fundamental problem, which is reproduction by horses remaining on the range.

The purpose of the Proposed Action is to consider a fertility control treatment program in order to maintain a population of 100 adult wild horses which is also within the AML of 70 – 140 wild horses. The purpose is also to stabilize the population in order to reduce the need for larger helicopter gather and removal operations. The Proposed Action in this EA considers the BLM's need to help maintain wild horse herd numbers to levels consistent with the AML and to make progress towards achieving standards of rangeland health. The need for the Proposed Action is to maintain the population in a thriving natural ecological balance by maintaining the wild horse population within the AML and to analyze the impacts to the wild horses from utilization of fertility control.

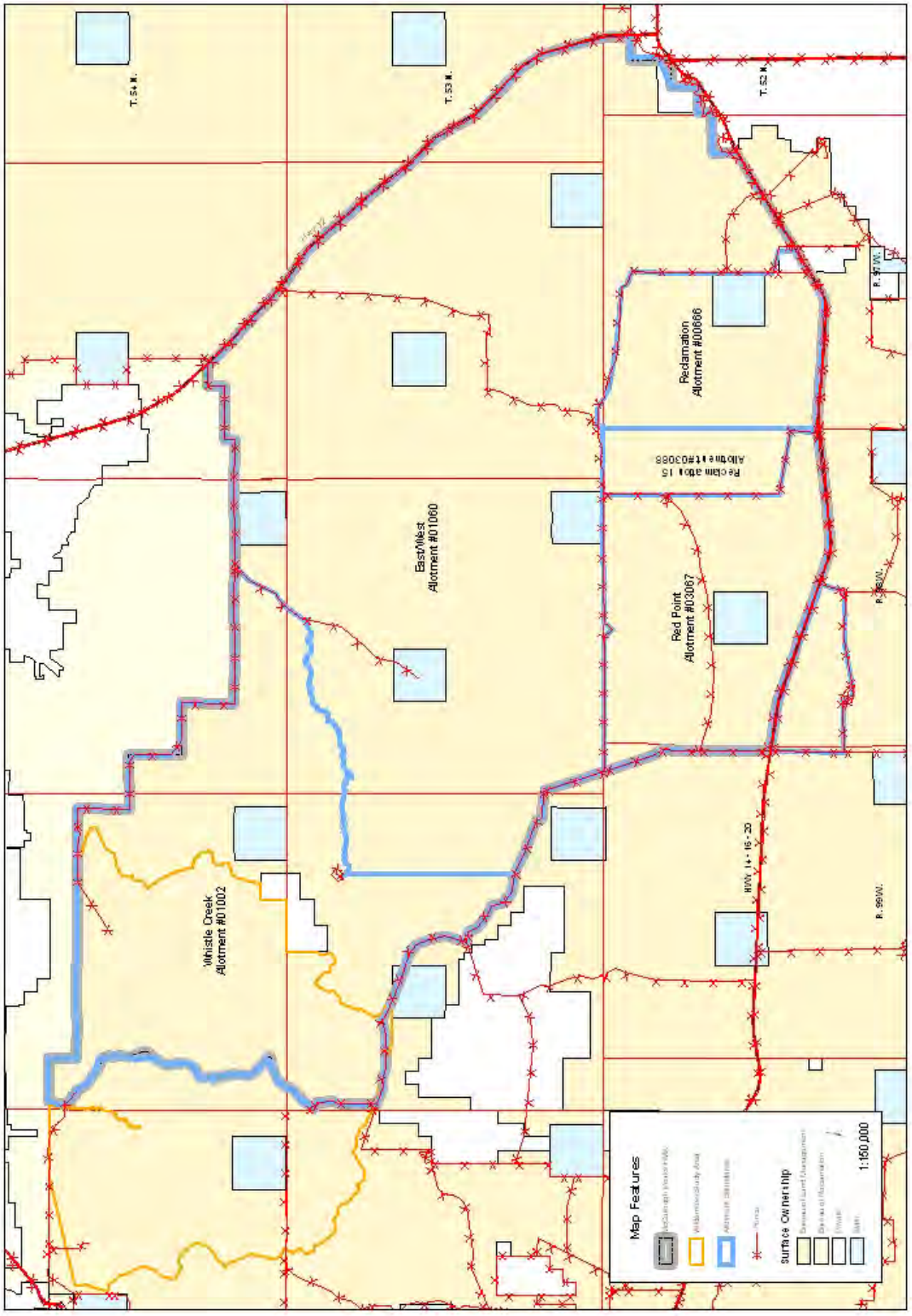
1.4 Decision to be Made

The BLM would decide whether or not to apply fertility control to select mares on the McCullough Peaks HMA through 2015 (or as long as we can reasonably conclude that no new information and no new circumstances have substantially changed in the area of analysis) in order to help maintain the appropriate management level (AML) of 70-140 wild horses through remote darting application utilizing liquid porcine zona pellucida (PZP) into selected mares over one year of age.

Map 1: General Location Map



Map 2: Grazing Allotments Within the McCullough Peaks HMA



1.5 Relationship to Planning

The proposed population control is in conformance with Cody Resource Management Plan, Final EIS and Record of Decision (ROD) (1990) objectives to manage for a balance between a healthy population of wild horses and improvements in range condition, wildlife habitat, and watershed condition.

The proposed action is in conformance with the Wild Free-Roaming Horses and Burros Act of 1971, (Public Law 92-195 as amended), and with all applicable regulations at 43 CFR (Code of Federal Regulations) 4700, and policies outlined by BLM. The Wild Free-Roaming Horses and Burros Act of 1971, (P. L. 92-195) as amended, Section 1333 (b) (1), states the Secretary of the Interior shall "determine appropriate management levels of wild free-roaming horses and burros on areas of public lands; and determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (such as sterilization or natural controls on population levels)." According to 43 CFR 4700.0-6, "Wild horses shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat."

2.0 PROPOSED ACTION and ALTERNATIVES

This EA focuses on the Proposed Action and No Action alternatives. The No Action alternative is considered and analyzed to provide a baseline for comparison of the impacts of the Proposed Action.

2.1 Proposed Action

The BLM Cody Field Office proposes to apply fertility control to select mares on the McCullough Peaks HMA through 2015 (or as long as we can reasonably conclude that no new information and no new circumstances have substantially changed in the area of analysis) in order to help maintain a population of 100 adult wild horses which is within the range of the appropriate management level of 70-140 adult wild horses. The fertility control would involve the use of PZP, single dose inoculations and the delivery system would be through the use of dart guns. The proposed action would consist of the administration of remote darting of PZP applied in the one year liquid dose and would start in 2011. The primary window for treatment would be February through June, although previously treated mares could receive a booster any time of the year. If it is determined that a mare or mares cannot be approached within darting range on foot, then bait trapping would be utilized and would be authorized by a site specific analysis. The expectations for the proposed action include: the short-term goal is to bring growth rates to less than five percent and the long-term goal is to reduce the need for gathers and removals, without jeopardizing the genetic health of the herd.

The Proposed Action incorporates the following additional actions and management requirements:

1. Fertility control treatment would be conducted in accordance with the approved standard operating and post-treatment monitoring procedures (SOP's, Appendix A).

2. In about March of 2011, mares that are one year of age would receive a primer inoculation of PZP and 30 – 60 days following that treatment would be treated annually with single dose of one-year PZP for no more than five (5) consecutive years.
3. To ensure that the genetic diversity of the herd is maintained: After year 5, there would be no further application of PZP until the (approximately 6 year old) mare produces a live foal. Once the mare has foaled, she would then be treated annually for the remainder of her natural life.
4. In October 2009, 16 mares were given the single dose primer treatment. These mares will be treated with booster inoculations of PZP beginning about March 2011. Depending on their age and status of contribution to the existing herd (i.e.: one surviving offspring) these mares would continue to receive annual boosters of single dose PZP the remainder of their lives.
5. The 17 mares given the 2-year pellet treatment in October 2009 would be treated with booster inoculations of PZP beginning about March 2011. Depending on their age and status of contribution to the existing herd (i.e.: one surviving offspring) these mares would continue to receive annual boosters of single dose PZP the remainder of their lives.

Once the PZP field darting treatment protocol is implemented fully, approximately two to three years after initiation, manpower and time involved would decrease. Field darting would be conducted in an opportunistic manner while the specialist is conducting routine monitoring activities as part of normal duties in the field. Ordinarily, field darting activities would be conducted on foot. Access throughout the HMA would be achieved by the use of 4X4 vehicles and other off-highway vehicles (OHVs). Vehicles would be utilized on existing roads and trails in the portions of the HMA that are not covered by a travel management plan. In the portion of the HMA that is covered by the McCullough Peaks Travel Management Plan, vehicles would be limited to designated roads and trails. On a case-by-case basis, the use of off-highway vehicles in closed areas may be allowed for certain reasons; however, such use shall be made only with the approval of the authorized officer in accordance with the McCullough Peaks Travel Management Plan.

Personnel authorized for field darting of the McCullough Peaks horses must be trained for this task and certified by the Science and Conservation Center at Zoo Montana. Additionally, all work would be carried out under the provisions stated here and in the SOP's in Appendix A.

The National Program Office would order the PZP vaccine which is then prepared and shipped to the Cody Field Office by the Science and Conservation Center at ZooMontana, in Billings, Montana. Each dose would consist of 100 micrograms of PZP in 0.5 cc buffer. Mixing of the vaccine would be accomplished as described in the Wild Horse Contraceptive Training Manual (see mixing procedures in Appendix B). Remote application would be by means of 1.0 cc Pneu-dart darts, with either 1.25 or 1.5 inch barbless needles, delivered by either Dan-inject or Pneu-dart CO2 powered or cartridge fired guns. An attempt would be made to recover all darts (normally about a 98% recovery is expected).

HORSE INDENTIFICATION

The treated mares would be individually marked and/or be individually recognizable without error. Additional identification is done by color, face, leg, and coat pattern markings. A photo database has been completed, as well as, individual identification photos have been compiled into books that can be taken to the field.

In the past, the United States Geological Survey (U.S.G.S.) has maintained the Wild Horse Identification and Management System (WHIMS) database of the McCullough Peaks HMA. BLM is in the process of trying take over to the WHIMS database. However this has not been possible due the inability to operate Access 2003 on BLM computers. If the BLM is not able to acquire the WHIMS database the current photo database that has been developed by the CYFO will continue to be utilized and will be updated regularly.

RECORD KEEPING

All darting records, foaling data, and health data would be recorded as per the data sheet (Appendix C). Data sheets would be maintained in the Cody Field Office. Copies would be sent to the BLM National WH&B Program Office in Reno and to the Science and Conservation Center in Billings, Montana.

REGULATORY AUTHORIZATION

The liquid PZP vaccine would be administered under the regulatory authority of the FDA, through investigational new animal drug exemption file 8857-G0002.

2.2. No Action Alternative

The no action alternative is required by the National Environmental Policy Act (NEPA) to provide a baseline for impact analysis.

Under the No Action Alternative, one-year PZP would not be remotely applied to wild horse mares in the McCullough Peaks HMA. A plan to gather and to apply fertility control would be evaluated and implemented at a later time. The BLM would continue vegetation and population monitoring.

2.3 Alternatives Considered but Eliminated from Further Analysis

2.3.1 Helicopter Capture, Treat and Release of Wild Horses with injection of PZP 22 fertility control vaccine for mares returned to the range.

Under this alternative, the BLM would implement a helicopter gather and capture of the entire population in order to selectively remove excess wild horses and apply two-year fertility control (PZP-22) to mares identified for release. This would immediately reduce the herd size to about 70 adult horses and treat about 35 mares. This alternative was considered but eliminated from further analysis because it would result in greater disturbance to individual wild horses and the herd than the Proposed Action. It is also estimated to be substantially more expensive to implement.

3.0 AFFECTED ENVIRONMENT

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area as identified during the Interdisciplinary Team process. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4. Resources issues or concerns, which may be affected by the proposed action or alternative and are further described in this environmental analysis, are wild horses.

The 2008/2009 McCullough Peaks HMA Gather and Fertility Control Implementation Plan and EA identified and analyzed the effects to the environment and are incorporated by reference. For a complete description of the affected environment and environmental consequences, see pages 17-38 of the EA. The EA can be found at:

http://www.blm.gov/wy/st/en/info/NEPA/cyfodocs/mcculloughpeakshma.html

3.1 Wild Horses

In 2004 an experimental form of the PZP vaccine was applied to 36 mares in the McCullough Peaks HMA. This pelleted form of the vaccine, referred to as cold evaporated pellets, was designed to provide two years of contraception with a single inoculation (Turner et al. 2008). Of those 36 mares, 17 eventually reproduced, five have died (of these 5 – 3 did not reproduce before dying) and 14 have yet to reproduce.

In 2009, PZP contraception was again applied to the McCullough Peaks horses, during the course of a gather and removal. In October 2009, there were 192 horses gathered and 94 horses removed from the McCullough Peaks Herd Management Area (HMA). The post gather population consists of approximately 14 horses not gathered and 96 horses that were returned to the HMA for a post population of approximatley110.

Eleven mares were given a primer dose of PZP, as described above, and presumably long-acting pellets, know as heat extruded pellets. It is expected these mares would not produce foals in 2011.

Another six mares originally treated in 2004, were given a booster dose and long-acting (two year) pellets. It is expected these mares would not foal in 2011.

Another nine mares not treated in 2004 were given a single primer dose of PZP. In order for contraception to be effective during the 2012 breeding season they must receive booster inoculations prior to the spring 2011 breeding season.

Finally, seven mares previously treated in 2004 were given a single booster inoculation. The expectation is that they would not produce foals in 2011.

The 14 mares treated in 2004 that have not since foaled were not re-treated in 2009 and would be tracked to determine the year they return to fertility (or die, whichever comes first). Once they have foaled, they would receive booster inoculations.

Recent research indicates that, normally using the standard two-inoculation protocol, efficacy in wild horses is about 95% (Kirkpatrick and Turner 2008). Reversal of contraceptive effects depends on the number of years of consecutive treatment. For example, mares treated for three consecutive years have a mean time 3.7 years to return of fertility, but the range is 1- 8 years (Kirkpatrick and Turner 2002). The same study demonstrated that mares treated from one to five consecutive years returned to fertility, but mares treated for seven consecutive years did not. Thus, the data from the 14 McCullough Peaks horses treated in 2004 and not yet returned to fertility after six years are consistent with the data from this study on Assateague Island. However, it must be recognized the 2004 McCullough Peaks treatments utilized a new experimental form of the vaccine, thus final results remain to be determined.

4.0 ENVIRONMENTAL EFFECTS

Assumptions for analysis:

This impact analysis assumes that a 100 percent treatment rate would be attained for identified mares. Liquid dose PZP is at least 95% effective in most herds. The SOP's in Appendix A and B, for use and application of PZP are incorporated as part of the proposed action. Impacts to the wild horses take the form of direct and indirect impacts and may occur on either the individual or the population as a whole.

The proposed action and alternatives incorporate proven standard operating procedures (Appendices A and B) which represent the "best methods" for ensuring quality results, minimizing risks and reducing impacts associated with this activity. All activity would be carried out according to current BLM policy with the intent of conducting as safe and humane an operation as possible. Protocols have been specifically developed for remote-delivery techniques of the fertility control vaccine.

4.1 Proposed Action

The immune-contraceptive PZP vaccine meets most of the requirements for an ideal contraceptive agent including criteria for safety and efficacy. When injected, PZP vaccine acts as an antigen and causes the mare's immune system to produce antibodies. These antibodies then bind to eggs in the mare's ovaries and effectively block sperm binding and fertilization (ZooMontana, 2000). The vaccine is relatively inexpensive and can be remotely administered in the field. Research has demonstrated that contraceptive efficacy is 95% for mares treated twice in the first year and boostered annually (Turner and Kirkpatrick, 2002). Contracepted mares sometimes show improvements in body condition and may actually live longer (Turner and Kirkpatrick, 2002).

Safety of the contraceptive agent is an important consideration. The agent to be used in the McCullough Peaks HMA is liquid, one-year PZP and has been studied and applied to wild horses for 21 years. The vaccine's contraceptive effects are reversible, if used no more than five consecutive years (Kirkpatrick and Turner 2002). The PZP vaccine is safe to use in pregnant mares: it would not affect the health or survival of foals that were in utero when the mother was treated (Turner and Kirkpatrick 2002). This is important consideration given the 340 day

gestation period of horses and the likelihood that some pregnant animals would be treated in the course of management.

The liquid, one-year PZP vaccine has not been found to affect seasonal birth patterns among treated animals, or the survival of offspring born to mares previously treated at Assateague Island National Seashore (Kirkpatrick and Turner 2003). A recent study of behavioral effects, conducted on Cape Lookout National Seashore in North Carolina, indicated there was an increase in mare movement between bands during the non-reproductive season (Nunez et al. 2009). However, the control group for this study was a group of untreated mares whose foals were captured and removed annually, thus there was no way to separate the effects of the gather and removal from the PZP treatment.

Direct individual impacts are those impacts that are immediately associated with implementation of the proposed action. These impacts include stress associated with the remote-darting activity for delivery of the vaccine. The intensity of these impacts varies by individual and is indicated by behaviors ranging from nervous agitation to physical distress. Impacts to individual mares from application of PZP (granulomas, nodules) would be monitored on a regular basis.

Both short and long-term effects of immunocontraception are important considerations. Other than occasional injection site reactions, no deleterious short-term health effects have been noted. Among wild horses on Assateague Island National Seashore (AINS), only three abscesses appeared after 381 treatments (0.007%). In another study, 60 wild mares receiving the standard two-inoculation protocol of PZP followed by a booster inoculation and observed in captivity for one month did not form a single abscess. Among zoo animal treated with PZP, 1,185 treatments with either darts or hand injections resulted in a total of 16 abscesses (0.013%) (Lyda et. al. 2005). In another study of injection site reactions in wild horses, nodules occurred in about 25% of the mares inoculated by dart in two herds, abscesses were too infrequent to allow meaningful analysis of the relation between covariates and the rate of abscess formation (Roelle and Ransom 2009). In all cases the abscesses were not a health threat and they resolved themselves within a few weeks.

The presence of abscesses should be minimized when utilizing the SOPs (Appendix A). In order to mitigate the impacts of fertility control, all vaccine would be controlled, handled and administered by trained, certified and experienced darters. These personnel would be on-site during all phases of the operation, and would be responsible for the accurate identification of individual age-specific mares.

Population-wide direct impacts are immediate effects which would occur during or immediately following implementation of the proposed action or alternatives. Remote-delivery of the fertility control vaccine would result in fewer disturbances to the herd and support a minimum feasible level of management. Direct population-wide impacts might consist of a heightened awareness of human presence following the darting activity. This is likely to be temporary in nature but may persist for some time in some mares.

Indirect individual impacts are those impacts that occur after the initial stress event and may develop as a result of the application of fertility control vaccine. Impacts that may occur include

increased social disorder among the horses and/or a prolonged foaling season. However, personal observations (by the CYFO Wild Horse Specialist) of the foaling season within the McCullough Peaks over the last 18 years have shown the mares foaled in February through November. Impacts may also result in an opportunity for increased fitness and body condition in treated mares.

Mares on liquid, one-year PZP-treatment had improved body condition scores, decreased herd and foal mortality, and significantly increased longevity (Turner and Kirkpatrick 2002; Kirkpatrick and Turner 2007). Previous studies revealed no significant changes in the estrous behavior or reproductive endocrine parameters (Kirkpatrick et al. 1992, 1995). However, Nunez et al. (2010) found increased estrous behavior among treated mares out of breeding season. Ransom et al. (2010) found increased reproductive behaviors among treated mares during breeding seasons in different populations.

Ransom et al. (2010) found no differences in how PZP-treated and control mares allocated their time between feeding, resting, travel, maintenance, and social behaviors in 3 populations of wild horses, which is consistent with Powell's (1999) findings in another population. Likewise, body condition of PZP-treated and control mares did not differ between treatment groups in Ransom et al' s (2010) study. Turner and Kirkpatrick (2002) found that PZP-treated mares had higher body condition than control mares in another population, presumably because energy expenditure was reduced by the absence of pregnancy and lactation.

In two studies involving a total of 4 wild horse populations, both Nunez et al (2009) and Ransom et al. (2010) found that PZP-treated mares were involved in reproductive interactions with stallions more often than control mares, which is not surprising given the evidence that PZP-treated females of other mammal species can regularly demonstrate estrus behavior while contracepted (Shumake and Wilhelm 1995, Heilmann et al. 1998, Curtis et al. 2002). Ransom et al. (2010) found that control mares were herded by stallions more frequently than PZP-treated mares, and Nunez et al. (2009) found that PZP-treated mares exhibited higher infidelity to their band stallion during the non-breeding season than control mares. Madosky et al (2010) found this infidelity was also evident during the breeding season in the same population that Nunez et al. (2009) studied, resulting in PZP-treated mares changing bands more frequently than control mares.

Aggression between stallions and mares has also been studied in 3 wild horse populations and no difference was found between the treatment groups (Ransom et al. 2010). Harem tending by stallions, such as urine and fecal covering of mare excretion and active defense of mares against other stallions, was best explained by a model of mare body condition in the Ransom et al (2010) study. Stallions in this study tended higher condition mares more frequently than lower condition mares.

Lastly, because PZP is a naturally occurring pig protein, it degrades quickly in the environment. If eaten, it is digested like any other protein and the vaccine cannot pass through the food chain, thus negating any environmental effects (Kirkpatrick et. al. 2006).

4.2 No Action

Under the No Action Alternative, one-year PZP would not be remotely applied to wild horse mares from the McCullough Peaks HMA. An opportunity to slow herd growth rates to less than or equal to 5 percent per year would be foregone. The Jenkins population model shows an average growth rate of 17.3% over the ten year model. Cost would continue to increase and horses would be subject to a greater number of gathers. A plan to gather, remove horses, and apply two-year fertility control would be evaluated and implemented at a later time.

The 2008/2009 McCullough Peaks HMA Gather and Fertility Control Implementation Plan and EA identified and analyzed the effects to the environment and are incorporated by reference. For a complete description of the environmental consequences resulting from the no action (either with or without gathers), see pages 29-38 of the EA.

5.0 CUMULATIVE IMPACTS

The cumulative impacts of implementing the 2008/2009 McCullough Peaks HMA Gather and Fertility Control Implementation Plan EA and subsequent FONSI and DR have been analyzed and are incorporated by reference. Therefore, only the cumulative impact to the wild horses from the use of fertility control is discussed.

Cumulative impacts are impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Past, present, and reasonably foreseeable activities that would be expected to contribute to the cumulative impacts of implementing the proposed action or alternatives would include past, present and future wild horse selective removals, fertility control treatments, natural mortality including variable predation, disturbance due to recreation and hunting, and increased or decreased size and quality of rangeland available for wild horse use. BLM would identify these impacts as they occur and mitigate them as needed on a project specific basis to maintain a thriving natural ecological balance and maintain acceptable levels of herd health. The Proposed Action would contribute to the cumulative impacts of future actions by maintaining the wild horse population near AML. Monitoring and management actions would establish a process whereby biological and/or genetic issues would be identified and resolved over time.

The cumulative impacts of the proposed action including foal production and herd size and growth over the next ten years is discussed in the 2008/2009 McCullough Peaks HMA Gather and Fertility Control Implementation Plan EA and incorporated by reference.

In addition as a predictive tool, the proposed action has been evaluated for cumulative impacts to the demographics (size, age structure, sex ratio) of the herd over time using WinEquus.

Parameters and output for these population modeling runs are shown in Appendix D. One of the objectives of the modeling would be to identify if any of the alternatives "crash" the population or cause extremely low population numbers or growth rates. Population modeling does not indicate that a crash is likely to occur to the population under the Proposed Action. Minimum population levels and growth rates were found to be within reasonable levels, and cumulative adverse impacts to the population are not likely. Furthermore, under the Proposed Action the wild horse population would have a 16.8% average growth rate over the 10 years and the median "average" population size would be 154 horses which is above Dr. Cothran's recommended (100 adults) population levels to maintain a healthy viable wild horse herd (2004 and2008/2009 McCullough Peaks Gather and Fertility Control Implementation Plans EA's). A limiting factor when using this population model and treating mares annually with PZP is that the program only allows the projection of fertility control effectiveness for 5 years of the 10 years that the model is running the trials. However, the results indicate that an average of 154 horses would remain, thus the population would not crash.

Additional population modeling runs are in the 2008/2009 McCullough Peaks HMA Gather and Fertility Control Implementation Plan EA, Appendix D. Modeling efforts forecast that the cumulative impacts for the proposed action would not be expected to reduce herd growth rates below a sustainable level under conditions of average natural mortality. In addition, the average adult herd size would not fall below the existing RMP objective of maintaining 100 adult horses, an important consideration in terms of maintaining genetic diversity within the McCullough Peaks herd.

Due to the relatively long time between generations (~10 years) and the long reproductive lifespan of individual horses, the loss of genetic material from the herd would be relatively slow and could be monitored and mitigated by management. There would be minimal impact to herd genetic diversity by restricting first time births to later in a mares life and reducing the lifetime contribution of older mares. Given the current levels of genetic diversity in the McCullough Peaks horses, suppressing herd growth rates over a five to ten year period would not be expected to result in deleterious cumulative genetic impacts (Cothran, 1992, 1999, 2004).

6.0 MITIGATION AND SUGGESTED MONITORING

Proven design features and monitoring are incorporated into the proposed action and also through standard operating procedures (SOP's), which have been developed over time. These SOPs (Appendix A, B, and C) represent the best methods for reducing impacts associated with remote application of PZP and collecting herd data. No additional mitigation would be recommended.

7.0 CONSULTATION AND COORDINATION

The BLM conducted internal, interdisciplinary scoping. The proposed action has been posted on the Cody NEPA log since November, 2010. No requests for information or inquiries from the public have been received to date regarding this action.

Issues that were identified in the scoping conducted in June 2008, as well as, issues and concerns that were identified in the 2008/2009 McCullough Peaks HMA Gather and Fertility Control

Implementation Plan EA and subsequent FONSI and Decision Record have been considered during the development of this EA regarding fertility control.

Additional scoping comments that were taken into consideration came from the Pryor Mountain fertility control scoping that was conducted August, 2010 and as described in the Pryor Mountain Wild horse Range Fertility Control Preliminary Environmental Assessment. The comments received for that action were in two categories; no use of fertility control and the use of fertility control more specifically modeled after Assateague National Seashore, Maryland. The effects to wild horses both direct and indirect were a repeated concern and consideration for animal welfare in relation to the use of PZP.

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Appendix A
Standard Operating Procedures for Population-level Fertility Control Treatments One-year liquid vaccine

The following implementation and monitoring requirements are part of the Proposed Action:

1. PZP vaccine would be administered through darting by trained BLM personnel or collaborating partners only. For any darting operation, the designated personnel must have successfully completed a nationally recognized wildlife darting course and who have documented and successful experience darting wildlife under field conditions.
2. Mares that have never been treated would receive 0.5 cc of PZP vaccine emulsified with 0.5 cc of Freund's Modified Adjuvant (FMA) and loaded into darts at the time a decision has been made to dart a specific mare. Mares identified for re-treatment receive 0.5 cc of the PZP vaccine emulsified with 0.5 cc of Freund's Incomplete Adjuvant (FIA).
3. The liquid dose of PZP vaccine is administered using 1.0 cc Pneu-Darts with 1.5" barbless needles fired from either Dan Inject® or Pneu-Dart® capture gun.
4. Only designated darters would mix the vaccine/adjuvant and prepare the emulsion. Vaccine-adjuvant emulsion would be loaded into darts at the darting site and delivered by means of a capture gun.
5. Delivery of the vaccine would be by intramuscular injection into the left or right hip/gluteal muscles while the mare is standing still.
6. Safety for both humans and the horse is the foremost consideration in deciding to dart a mare. The Dan Inject® gun would not be used at ranges in excess of 30 m while the Pneu-Dart® capture gun would not be used over 50 m, and no attempt would be taken when other persons are within a 30-m radius of the target animal.
7. No attempts would be taken in high wind or when the horse is standing at an angle where the dart could miss the hip/gluteal region and hit the rib cage. The ideal is when the dart would strike the skin of the horse at a perfect 90° angle.
8. If a loaded dart is not used within two hours of the time of loading, the contents would be transferred to a new dart before attempting another horse. If the dart is not used before the end of the day, it would be stored under refrigeration and the contents transferred to another dart the next day. Refrigerated darts would not be used in the field.
9. No more than two people should be present at the time of a darting. The second person is responsible for locating fired darts. The second person should also be responsible for identifying the horse and keeping onlookers at a safe distance.
10. To the extent possible, all darting would be carried out in a discrete manner. However, if darting is to be done within view of non-participants or members of the public, an explanation of the nature of the project would be carried out either immediately before or after the darting.
11. Attempts will be made to recover all darts. To the extent possible, all darts which are discharged and drop from the horse at the darting site would be recovered before another darting occurs. In exceptional situations, the site of a lost dart may be noted and marked, and recovery efforts made at a later time. All discharged darts would be examined after recovery in order to determine if the charge fired and the plunger fully expelled the vaccine.

12. All mares targeted for treatment will be clearly identifiable through photographs to enable darters and HMA managers to positively identify the animals during the project and at the time of removal during subsequent gathers.
13. Personnel conducting darting operations should be equipped with a two-way radio or cell phone to provide a communications link with the Project Veterinarian for advice and/or assistance. In the event of a veterinary emergency, darting personnel would immediately contact the Project Veterinarian, providing all available information concerning the nature and location of the incident.
14. In the event that a dart strikes a bone or imbeds in soft tissue and does not dislodge, the darter would follow the affected horse until the dart falls out or the horse can no longer be found. The darter would be responsible for daily observation of the horse until the situation is resolved.

Monitoring and Tracking of Treatments:

1. At a minimum, estimation of population growth rates using helicopter or fixed-wing surveys will be conducted before any subsequent gather. During these surveys it is not necessary to identify which foals were born to which mares; only an estimate of population growth is needed (i.e. # of foals to # of adults).
2. Population growth rates of herds selected for intensive monitoring will be estimated every year post-treatment using helicopter or fixed-wing surveys. During these surveys it is not necessary to identify which foals were born to which mares, only an estimate of population growth is needed (i.e. # of foals to # of adults). If, during routine HMA field monitoring (on-the-ground), data describing mare to foal ratios can be collected, these data should also be shared with the NPO for possible analysis by the USGS.
3. A PZP Application Data sheet will be used by field applicators to record all pertinent data relating to identification of the mare (including photographs if mares are not freeze-marked) and date of treatment. Each applicator will submit a PZP Application Report and accompanying narrative and data sheets will be forwarded to the NPO (Reno, Nevada). A copy of the form and data sheets and any photos taken will be maintained at the field office.
4. A tracking system will be maintained by NPO detailing the quantity of PZP issued, the quantity used, disposition of any unused PZP, the number of treated mares by HMA, field office, and State along with the freeze-mark(s) applied by HMA and date.

Appendix B
Mixing Procedures

Mixing Vaccine and Adjuvant

Equipment Needed

2 5.0 cc glass syringes
1.5 inch needle
vial of adjuvant
vial of PZP
Luer-Lok connector
1.0 cc C-type or P-type Pneu-Dart dart with 1.5 inch barbless needle

Procedures

1. Place the 1.5 inch needle on a glass syringe
2. Draw out 0.5 cc of adjuvant
3. Using the same syringe, draw up the 0.5 cc of PZP
4. Holding the syringe very carefully (because the plunger can slip out), take off the needle and attach the syringe to the second syringe using the Luer-Lok connector (have the Luer-lok connector already attached to the second syringe).
5. Push the PZP-adjuvant mixture back and forth through the two syringes 100 times. The resulting emulsion would become thick and look white. THIS PROCUDURE IS VERY IMPORTANT AND IS RELATED TO THE PRESENTATION OF THE ANTIGEN AND THE SUBSEQUENT EFFICACY OF THE VACCINE.
6. Make sure all the emulsion is in one syringe.
7. Holding the first syringe very carefully (the one with the emulsion), remove the second syringe, leaving the Luer-Lock on the first syringe.
8. If you are loading a 2.0 or 3.0 plastic syringe for hand-delivery, attach the glass syringe to the plastic syringe and inject the PZP emulsion in to the plastic syringe. It is helpful if you move the plunger of the plastic syringe just a bit before pumping the PZP emulsion into it. After loading the plastic syringe, disconnect the glass syringe and connect an 18g. 1.5 inch needle on the plastic syringe.

Appendix C

McCULLOUGH PEAKS HORSE IMMUNOCONTRACEPTION DATA SHEET

HORSE NO. (and NAME): 732 Freckleback # 9038 Sabrina

HORSE BIRTH YEAR: 2000 Treatment/Control: (T) C

Previous Reproductive History (foals/year of birth):

Year	Foal	Year	Foal	Year	Foal
2011		2002		1993	
2010		2001		1992	
2009		2000		1991	
2008		1999		1990	
2007		1998		1989	
2006		1997		1988	
2005	0521 ♀	1996		1987	
2004	0440 ♂	1994		1985	
2003	0341 ♀				

Inoculation Dates	PZP Dose (µg)*	Adjuvant	Delivery System	Injection Site	Vac. Lot #
16 Oct '04	100µg Pellet	F. complete	hand	left hip	ZMT 050803

Post-Inoculation Reproductive History (Diagnosed pregnancies and/or births)

2004 Fall Preg test = Pos, 2005 foal 0521 ♀ [18-May]

2009 No PZP treatment given - No foals born since 2005 (No Foals 2006 → 2010)

*Standard dose is 100 µg unless otherwise noted

Appendix D
Population Modeling

Population Modeling - McCullough Peaks HMA

To complete the population modeling for the McCullough Peaks HMA, version 1.40 of the WinEquus program, created April 2, 2002, was utilized.

Population Data, Criteria, and Parameters utilized for Population Modeling

Initial age structure for the 2010 herd was developed from actual data from the original 2009 returned horses and the 2010 foals that have been born since.

The following table displays the age structure for returned animals and the existing population of horses as of October 2010.

Age Structure 2010

Age Class	McCullough Peaks Post Gather Population **October 2010**	
	Females	Males
Foals	11	8
1	6	9
2	2	2
3	2	6
4	2	2
5	6	8
6	5	10
7	4	-
8	5	5
9	6	4
10-14	15	10
15-19	5	2
20+	3	5
Total	72	71
TOTAL POPULATION	**143 (124 adults)**	

Of the 72 females, 17 are of non-breeding age which equals 61 females and of these 14 are non-reproductive leaving 47 females as the breeding population that would be receiving the fertility control treatment. An estimated maximum of five horses that have been missing and possibly died over the winter have not been subtracted from the totals above.

For consistency, same survival probabilities, sex ratio at birth, foaling rates were used as in the population modeling in the 2008/2009 McCullough Peaks HMA Gather and Fertility Control Implementation Plan EA. The simulation used the survival probabilities and sex ratio at birth that was collected by USGS seasonal employees.

The foaling rates were based upon data collected by M. Ashley and S. Jenkins at Garfield Flat, Nevada between 1993 and 1999. These foaling rates may be slightly higher than would be expected in McCullough Peaks given that 14 mares have not foaled in the past six years.

Survival probabilities and foaling rates utilized in the population model are displayed in the following table:

Survival Probabilities and Foaling Rates

Age Class	Survival Probabilities		Foaling Rates
	Females	Males	
Foals	.875	.875	0
1	.969	.969	0
2	.951	.951	.52
3	.951	.951	.67
4	.951	.951	.76
5	.951	.951	.89
6	.951	.951	.76
7	.951	.951	.90
8	.951	.951	.88
9	.951	.951	.91
10-14	.951	.951	.81
15-19	.951	.951	.82
20+	.951	.951	.75

The following is the sex ratio at birth was utilized in the population modeling:

Sex ratio at Birth:

58% Males
42% Females

The following percent effectiveness of fertility control was utilized in the population modeling for Alternative I:

Year 1, 2, 3, 4, and 5 all have 95% effectiveness

Contraception Criteria

(Alternatives I & II)

Age Class **(Mares)**	**Percentages for Fertility Treatment**
1- 4 yrs	100%
5 – 9	95%
10+	90%

Population Modeling Criteria

The following summarizes the population modeling criteria that are common to the Alternatives:

- Starting Year: 2010
- Sex ratio at birth: 58% males – 42% females
- Foals are **NOT** included in the AML
- Simulations were run for ten years with 100 trials each

Population Modeling Results - McCullough Peaks HMA

Population Modeling Results

All data was verified and trials were re-run with the results shown below. These are results are based on data from the Garfield Flat HMA for foaling rates. It should be noted that the data does not take into account the 14 mares that have not returned to fertility 6-years after treatment with PZP (2-yr. cold pellet given in 2004).

Population size in ten years

Out of 100 trials in each simulation, the model tabulated minimum, average, and maximum population sizes. The model was run from starting in 2010 and continuing for 11 years to determine what the potential effects would be on population size for the proposed action and alternatives. These numbers are useful to make relative comparisons of the different alternatives, and potential outcomes under different management options. The data displayed within the tables is broken down into different levels. The lowest trial, highest trial, and several in between are displayed for each simulation completed. According to the creator of the modeling program, this output is probably the most important representation of the results of the program in terms of assessing the effects of proposed management, because it shows not only expected average results but also extreme results that might be possible.

Population Sizes in 11 years - Minimum

Alternative	Proposed Action (fertility control only)	No Action
Lowest Trial	131	124
10th Percentile	146	146
25th Percentile	149	149
Median Trial	**154**	**157**
75th Percentile	163	167
90th Percentile	177	176
Highest Trial	229	254

This table shows that in eleven years and 100 trials for each alternative, the lowest number of 0-20+ year old horses ever obtained was 124 under the No Action. Additional interpretation may be made by comparing the various percentile points. For example, for the Proposed

Action, 10% of the trials resulted in fewer than 177 wild horses as the minimum population, and 10% of the trials resulted in a minimum population larger than 146 wild horses. In other words, 80% of the time, one could expect a minimum population between these two values for the Proposed Action, given the assumptions about survival probabilities, foaling rates, initial age-sex distribution, and management options made for this simulation. Both alternatives allow for a genetically viable population as stated in the Genetic Studies conducted in 1992, 1999, and 2004 by Dr. Gus Cothran.

Population Sizes in 11 years - Average

Alternative	Proposed Action (fertility control only)	No Action
Lowest Trial	210	206
10th Percentile	315	310
25th Percentile	369	353
Median Trial	**396**	**408**
75th Percentile	456	470
90th Percentile	529	518
Highest Trial	666	642

This table displays the average population sizes obtained for the 100 trials run for each alternative. The average population size across eleven years ranged from a low of 206 wild horses under the No Action, to a high of 666 wild horses under Proposed Action.

Population Sizes in 11 years - Maximum

Alternative	Proposed Action (fertility control only)	No Action
Lowest Trial	284	301
10th Percentile	558	514
25th Percentile	651	620
Median Trial	**744**	**787**
75th Percentile	938	930
90th Percentile	1117	1050
Highest Trial	1423	1300

This table displays the largest populations that could be expected out of 100 trials for each alternative. The figures for the Lowest Trial represent what the population is likely to be in 2021. The numbers vary due to randomness and assumptions inherent to the modeling program.

Average Growth Rates in ten years

Average growth rates were obtained by running the model for 100 trials from 2010 to 2020 for the proposed action and each alternative. The following table displays the results obtained from the model:

Average Growth Rate in 10 Years

Alternative	Proposed Action (fertility control only)	No Action
Lowest Trial	5.6	7.2
10th Percentile	13.2	12.2
25th Percentile	15.5	14.4
Median Trial	**16.8**	**17.3**
75th Percentile	19.4	19.1
90th Percentile	21.1	20.4
Highest Trial	24.0	23.4

For the median trial, the fertility control alternative (Alternative I) is 16.8% and is lower than the non-fertility control (No Action). The range of growth rates is a reasonable representation of what could be expected to occur in a wild horse population. However, since the model is not able to calculate the 95% effectiveness over the ten year period it does not provide the true results.